CRAWL TOY

RELATED APPLICATION

This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Application No. 60/411,620 filed on September 18, 2002. The entire disclosure of this earlier application is hereby incorporated by reference.

FIELD OF THE INVENTION

This invention relates generally as indicated to a crawl toy and, more particularly, to a toy which provides a crawl incentive when a child is learning to crawl.

BACKGROUND OF THE INVENTION

Crawling is an important milestone in a child's development. Crawling helps a baby to strengthen "walking" muscles for later use and is a baby's first experience with getting around efficiently on his/her own. As such, parents and care givers typically provide "crawling" incentives to a toddler to encourage experimentation with bodily sensations and motor movements.

SUMMARY OF THE INVENTION

The present invention provides a toy which can be used as a crawling incentive for a child and then can be converted to a remote control toy upon completion of the child's crawling phase. In this manner, the toy "grows with" the child and remains interesting once walking replaces crawling in the child's ongoing development.

More particularly, the present invention provides a toy which is convertible between a crawl mode and a remote-control mode. The toy comprises a mobile body, an input, and a controller. The input is attached to the mobile body while the toy is in the crawl mode and provides a response (*e.g.*, movement, audio stimulation) upon activation (*e.g.*, manual touching) when the toy is in said crawl mode. The controller controls the mobile body from a remote location while the toy is in the remote-control mode. The toy preferably comprises a plurality of

inputs which provide the same response while the toy is in the crawl mode and/or which provide a different response when the toy is in the remote-control mode.

The input can be conveniently housed in the controller and the controller can be attached to the mobile body while the toy is in the crawl mode. For example, the mobile body and the controller can include mating members which, when mated, place the toy in the crawl mode and, when un-mated, place the toy in the remote-control mode. The mobile body can comprise a base, rollers rotatably attached to the bottom of the base, and an antenna attached to the top of the base. The controller can comprise a ring-shaped member with a central opening through which the antenna can be inserted. The input(s) can comprise button(s) positioned on the radially outer surface of the ring-shaped member.

When a child is learning to crawl, the toy is placed in the crawl mode so that the child can crawl towards the mobile body and activate the input. When the child has advanced to walking and no longer needs crawling incentives, the toy is placed in the remote-control mode so that he/she can use the controller to control the mobile body from a remote location. As such, the toy of the present invention can convert from a crawling incentive to the child's first remote control device.

The present invention also provides a toy which provides different outputs in response to different positional relationships of the child. In this manner, the child is rewarded when approaching the toy, and is rewarded again upon further nearing the toy. This can provide a powerful crawl incentive when a child is learning to crawl. However, the toy need not be a crawl-incentive toy, as the present invention contemplates many types of toys that respond to a child's different positional relationships with different outputs.

More particularly, the present invention provides a body, a proximity sensor, and response-providing components. The proximity sensor senses when a child is in a first zone Z1 relative to the body and when a child is in a second zone Z2 relative to the body. The response-providing components provide a first response output in response to the child entering the first zone Z1

and a second different response output in response to the child entering the second zone Z2.

When a child is playing with the toy, and he/she is outside the first zone Z1, no response output is provided. When the child moves (*e.g.*, crawls) into the first zone Z1, a first response output is provided. When the child moves (*e.g.*, crawls, reaches) closer to the toy 50 into the second zone Z2, a second response output is provided. The response outputs can be audio (*e.g.*, music, voice messages), movement (*e.g.*, spins, forward/backward motion), visual (*e.g.*, flashing/colored lights), and/or combinations thereof.

The range of the zones Z1 and Z2 can be selected to be compatible with a child's developmental requirements. For example, the first zone Z1 could be greater than a certain distance (*e.g.*, two inches, three inches, four inches, five inches, six inches, one foot, etc.) and less than a certain distance *(e.g.*, one inch, two inches, three inches, four inches, six inches, etc.) away from the toy. The second zone Z2 is positioned between the first zone Z1 and the toy.

These and other features of the invention are fully described and particularly pointed out in the claims. The following description and annexed drawings set forth in detail certain illustrative embodiments of the invention, these embodiments being indicative of but a few of the various ways in which the principles of the invention may be employed.

DRAWINGS

Figure 1 is a perspective view of a toy according to the present invention, the toy being shown in the crawl mode.

Figure 2 is a perspective view of the toy in the remote-control mode.

Figure 3 is a close-up, partially sectional, view of a portion of the toy while in the crawl mode.

Figures 4A - 4C are schematic illustrations of a child playing with the toy while it is in the crawl mode.

Figures 5A - 5C are schematic illustrations of a child playing with the toy while it is in the remote-control mode.

Figure 6 is a perspective view of another crawl toy 50 according to the present invention, the toy 50 providing different outputs in response to different positional relationships.

Figure 7A - 7C are schematic illustrations of a child playing with the toy by moving into different positional relationships to obtain different outputs.

DETAILED DESCRIPTION

Referring now to the drawings, and initially to Figures 1 and 2, a toy 10 according to the present invention is shown. The toy 10 comprises a mobile body 12 and a controller 14. When the toy 10 is in a crawl mode (Figure 1), the controller 14 is attached, coupled, or otherwise connected to the mobile body 12 so that it may move therewith. When the toy 10 is in a remote control mode (Figure 2), the controller 14 is separated from mobile body 12 so that it may be used to remotely control movement of the body 12. In this manner, the toy 10 is convertible between a crawl mode appropriate for a child at a crawling age and a remote control mode appropriate for the child at an older age. The toy 10 can thereby "grow with" the child.

Referring additionally to Figure 3, the mobile body 12 and the controller 14 preferably include mating members 16 and 18, respectively. In the illustrated embodiment, the mating member 16 is a recess in the mobile body 12 and the mating member 18 is a tab on the controller 14 which fits into the recess. When the members 16 and 18 are mated, an internal switch places the toy's electrical circuitry in the crawl mode and, when the members 16 and 18 are displaced, switches the toy's electrical circuitry into the remote-control mode. It may be noted that other types of mating devices can be used to determine the positional relationship between the mobile body 12 and the controller 14. Moreover, non-mating devices, such as proximity sensors, can be used to determine this positional relationship, whereby the controller 14 need not be "locked" onto the mobile body 12. Additionally or alternatively, the conversion of the toy 10 from the crawl mode to the remote-control mode can be accomplished by other types of switch and non-switch devices.

The mobile body 12 includes an infrared device 20 which functions as a transmitter, and the controller 14 includes an infrared device 22 which functions as a receiver. These devices allow wireless communication between the controller 14 and the mobile body 12 so that an input on the controller 14 is conveyed to the mobile body 12. Accordingly, the infrared device 20 is mounted in a suitable manner for receiving infrared signals from the controller's transmitting infrared device 22.

In the illustrated embodiment, the mobile body 12 comprises a base 24, rollers 26 rotatably attached to the bottom of the base 24, and an antenna 28 attached to the top of the base 24. The body parts 24, 26, and/or 28 can be injection molded, or otherwise formed, and then assembled in a conventional manner. That being said, the mobile body 12 can be of any construction which provides a motive means (*i.e.*, rollers, tracks, crawlers, skis) by which it can move across a surface.

The illustrated base 24 houses the toy's electrical circuitry, mechanical guts (*e.g.*, wheel-driving motors and belts), and power source (*e.g.*, battery). The mating recess 16 is positioned at the top of the base 24 adjacent the antenna 28. The mode-conversion switch and the infrared receiver 20 are electrically coupled to the electrical circuitry, and the electrical circuitry controls the mechanical components. The base 24 can be spherical in shape and/or include indicia (*e.g.*, a smiling face) attractive to a child.

The rollers 26 allow the mobile body 22 to easily move across a surface (*e.g.*, the floor) and can comprise three spherical wheels 30 rotatably mounted within wheel covers. The front two wheels can be driven via motors and belts (not shown) and the back wheel can be free-floating to accomplish the desired movement of the body 22. For example, for forward movement, both of the front wheels would be rotated forward and, for spinning movement, one front wheel could stop while the other front wheel spins. However, as was indicated above, the rollers 26 can be replaced with other suitable motive means for moving the body across a surface.

The antenna 28 is preferably flexible and can comprise a curved stem 32 extending upwardly from the base 24 and a spherical knob 34 at the end

thereof. In the illustrated embodiment, the infrared device 22 (*e.g.*, the receiver) is mounted in the antenna's knob 34 in a suitable manner for receiving signals from the controller's infrared device 20 (*e.g.*, the transmitter). In this manner, signals can be conveyed from the controller 14 to the electrical circuitry within the body 24 to control the toy's mechanical components.

The illustrated controller 14 has a ring-like (*e.g.*, toroidal) shape with a central opening through which the antenna 28 can be inserted. The mating tab 18 extends from the bottom surface of the controller 14 so that it may be inserted into the recess 16 when the controller 14 is connected to the mobile body 12. It may be noted that even when the toy 10 is in the remote-control mode, the controller 14 may be placed on the antenna 28 without mating the members 16 and 18 for convenient storage. Alternatively, as indicated above, the toy 10 can be designed so that mere placement of the controller 14 in the vicinity of the mobile body 12 is sufficient for conversion into the crawl mode.

Input buttons 36, 38, and 40 are positioned on the radially outer surface of the controller 14, along with the infrared sensor 22. In the illustrated embodiment, the inputs are activated by manual depression, but otherwise activated inputs could be used instead of, or in addition to, the buttons. Also, although three inputs are shown in the illustrated embodiment, toys having fewer (*i.e.*, one or two) or more inputs are possible with, and contemplated by, the present invention. In any event, the input(s) 36, 38, and 40 are attached to the mobile body 12 while the toy 10 is in the crawl mode.

Referring now to Figures 4A - 4C, a child is shown playing with the toy 10 while it is in the crawl mode (*i.e.*, the controller 14 is attached to the mobile body 12 and the mating members 16 and 18 are mated). In this mode, the child crawls towards the toy 10 and pushes one of the plurality of buttons 36, 38, and 40. In response, the toy 10 provides the child with some type of stimulation to reward the crawling effort. For example, the toy 10 can emit audible sounds (*e.g.*, giggling, music, etc.), produce visual images (*e.g.*, flashing lights, sparks, etc.), and/or can initiate movement (*e.g.*, move forward, spin, etc.). While audible and visual outputs can be pleasing to a child, it may be noted that forward movement will encourage the child to crawl further. The toy 10 can be

programmed so that regardless of which button the child pushes, the same response is provided by the toy 10. Alternatively, the toy 10 can be programmed so that different buttons provide different responses. In the preferred embodiment, the mobile body 12 emits a giggling sound, moves forward while playing music, and then giggles again, regardless of which button the child pushes.

Referring now to Figures 5A - 5C, an older child is shown playing with the toy 10 while it is in the remote-control mode (*i.e.*, the controller 14 is separated from the mobile body 12). In this mode, the child uses the controller 14 to remotely control the mobile body 12 by pushing one of the plurality of buttons 36, 38 and 40. Again, the toy 10 can be programmed so that regardless of which button the child pushes, the same response is provided by the toy 10. Alternatively, the toy 10 can be programmed so that different buttons provide different responses. For example, activation of the button 36 can cause the mobile body 12 to spin (Figure 5A), activation of the button 38 can cause the mobile body 12 to move forward (Figure 5B), and activation of the button 40 can cause the mobile body 12 to emit an audible sound (*e.g.*, giggling or music) (Figure 5C).

It may be noted that in the illustrated embodiment of the invention, the inputs 36, 38 and 40 are housed in the controller 14, and attachment of the controller 14 to the mobile body 12 places the toy 10 in the crawl mode. This design has certain advantages and conveniences, in that the same set of inputs can be used for both the crawl mode and the remote-control mode. That being said, a separate set of inputs for the crawl mode and/or another mode-converting technique (*e.g.*, a switch on the mobile body) could be used instead.

Referring now to Figure 6, a toy 50 according to another embodiment of the invention is shown. The toy 50 is adapted to provide one response when a child moves into a first zone Z1 and another response when a child moves into a second zone Z2. In this manner, the child is rewarded when approaching the toy 50 and rewarded again upon further nearing the toy 50.

The toy 50 comprises a body 52 which, in the illustrated embodiment, comprises a base 54, rollers 56 rotatably attached to the bottom of the base 54,

and an antenna 58 attached to the top of the base 54. The body parts 54, 56, and/or 58 can be injection molded, or otherwise formed, and then assembled in a conventional manner. However, unlike the toy 10 described above, the body 52 need not be mobile body and need not include motive means (*i.e.*, rollers, tracks, crawlers, skis) by which it can move across a surface. That being said, a child might enjoy manually pushing the toy 50 across the floor and/or in certain circumstances a motive means may provide the desired output for the toy in one or more zones.

The illustrated base 54 houses the toy's electrical circuitry, response-producing equipment, and a power source (*e.g.*, battery). The rollers 56 and can comprise three spherical wheels 60 rotatably mounted within wheel covers. The antenna 58 is preferably flexible and can comprise a curved stem 62 extending upwardly from the base 54 and a spherical knob 64 at the end thereof. The electrical circuitry preferably includes an on-off switch for the toy 50. The response-producing equipment can comprise a proximity sensor 66 electrically coupled to the circuitry housed within the antenna 58.

The sensor 66 can comprise, for example, two conductive (*e.g.*, metal) plates insulated from each other and positioned inside the base 54 and/or the antenna 58. The plates are connected to toy's electrical circuitry, which supplies appropriate frequency signals thereto. A child in the first zone Z1 creates a capacitance to ground, and the electrical circuitry measures this capacitance and provides a response output. As the child moves towards the toy 50 into the second zone Z2, the capacitance is further increased, and the electrical circuitry measures increased capacitance and provides a different response output.

Referring now to Figures 7A-7C, a child is shown playing with the toy 50. When the child is outside the first zone Z1, no response output is provided. (Figure 7A.) When the child moves into the first zone Z1, a first response output is provided. (Figure 7B.) When the child moves closer to the toy 50 into the second zone Z2, a second response output is provided. (Figure 7C.) In the illustrated embodiment, the response outputs are each audio and, more particularly, music. For example, one song could play in the first zone Z1 and another song could plan in the second zone Z2. Instead of songs, a first voice

message could sound in the first zone Z1 (*e.g.*, "you are getting closer") and a second voice message could sound in the second zone Z2 (*e.g.*, "you are almost there"). Also, a song could play in one zone and a voice message sound in the other zone.

Additionally or alternatively, the toy 50 could move in one manner (*e.g.*, turn and twirl) in response to the child entering one zone and could move in another manner (*e.g.*, forward or backward) in response to the child entering the other zone. The toy 50 could provide one visual output (e.g., flashing yellow light) in response to first zone entry and another visual output (e.g., green light) in response to second zone entry. The toy 50 could provide a visual output in response to the child entering one zone and an audio output in response to the child entering the other zone; a visual output in response to the child entering one zone and a movement output in response to the child entering the other zone; an audio output in response to the child entering one zone and a movement output in response to the child entering the other zone. Audio, movement, and/or visual outputs can be combined to create the response output.

In any event, the toy 50 has the appropriate equipment to provide the desired audio response(s) (*e.g.*, players, speakers), the desired movement response(s) (*e.g.*, motor, pulleys), and/or the desired visual response(s) (*e.g.*, lights, flashers).

The range of the zones Z1 and Z2 can be selected to be compatible with a child's developmental requirements. For example, the first zone Z1 could be greater than a certain distance (*e.g.*, two inches, three inches, four inches, five inches, six inches, one foot, etc.) and less than a certain distance (e.g., one inch, two inches, three inches, four inches, six inches, etc.) away from the toy 50. The second zone Z2 is positioned between the first zone Z1 and the toy 50. It may be noted that more zones (*i.e.*, third zones, fourth zones, fifth zones etc.) are contemplated by and possible with the present invention.

In the illustrated embodiment, the toy 50 provides a crawl incentive when a child is learning to crawl by responding to two different positional relationships with two different outputs. However, more than two trigger zones and a

corresponding number of outputs is possible with and contemplated by the present invention. Moreover, the toy 50 need not be a crawl-incentive toy as the present invention contemplates any type of toy that responds to a child's different positional relationships with different outputs.

Although the invention has been shown and described with respect to certain preferred embodiments, it is obvious that equivalent and obvious alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification. The present invention includes all such alterations and modifications and is limited only by the scope of the following claims.